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OIL SPILLS ANALYSIS IN THE PERUVIAN COAST USING EARTH OBSERVATION DATA: LA PAMPILLA REFINERY CASE 2022

Abstract

Oil spills have important environmental effects due to the damage to the flora and fauna of an ecosystem, besides of the impact on human health that can include respiratory problems, eye and skin irritation, and neurological problems. According to United Nations Environment Programme (UNEP) the average total worldwide annual release of petroleum into the sea has been estimated at 1.3 million tons of oil from all known sources. Peru is no stranger to this type of disaster and it has been reported that in the last ten years 88% of oil spills have occurred on the north coast of the country. In the particular case of this study, the oil spills occurred in mid-January 2022, when the Italian-flagged ship Mare Doricum was in the process of unloading oil at the terminal No. 2 of La Pampilla refinery, located in the district of Ventanilla in Callao, Peru. The present study analyzes the oil spill of 11 900 barrels occurred in the Peruvian coast in the Pampilla refinery in January of 2022. In order to identify and quantify the impact of oil spills in the Peruvian sea, data from the Sentinel 1A and 1B were used. The analysis of Syntethic Aperture Radar (SAR) data allow us to obtain textural difference, physical characteristics such as backscatter levels and certain geometric, spectral and spatial characteristics to identify the presence of hydrocarbon in the study area. The results obtained from this analysis were that one month after the occurrence of the spill the hydrocarbon was spread up to 64 km from the source of the spill in the Pampilla refinery, affecting approximately 106 km2 and at least 24 Peruvian beaches.